Phonetic and phonological petit shifts

TOMITA Kaoru
(English phonetics)

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Abstract

Studies of language changes and their approaches are surveyed in this study. Among the changes, vowel shifts and consonant shifts observed in the history of language and modern English, and stress shifts in present-day English are introduced and discussed. Phonological studies of these sound changes, generally, present rules or restrictions. On this basis, it is proposed that consonant changes, vowel changes or stress shifts are better observed in several types of language or social contexts. It is especially emphasized that the phenomena of language changes in a real situation are to be found by observing words, phrases, sentences and even paragraphs spoken in quiet or hurried situations.

Introduction

Phonetic science states that language sound change is depicted as a phonetically conditioned process that originates through the mechanism of speech production. This standpoint is criticized from a large body of empirical evidence that has important consequences. Some propose frequency in use while others propose gender as the factor to explain sound changes. Sociolinguists claim that explanations that put an emphasis on language contexts or social contexts would lead the phonetic and phonological studies into the exploration of language sound changes in real situations. This paper surveys language sound changes, such as historical vowel shifts and consonant shifts, and stress shifts, with an explanation from the phonetic or social standpoints. Furthermore, it is proposed that the study of the phonetic or phonological shifts due to speaking styles, especially, some of those reflected in quiet or hurried speeches, would reveal the essential factors of language sound changes.

Consonant shifts

In the First Consonant Shift discovered by Grim, nine consonants, /p/, /t/, /k/, /b/, /d/, /g/, /bh/, /dh/, /gh/ in Latin shifted into /f/, /th/, /h/, /p/, /t/, /k/, /b/, /d/, /g/, in German, respectively. In the Second Consonant Shift, consonant /z/ became /d/ (Mikawa, 2006, 11).

The study of this type of consonant shifts is not the only old one. These can be found with statistically positive proof by looking for the words that are phonetically similar with that and have the same meaning as is explained in Diamond (2011, 291):

> … linguists scrutinize word lists for putative cognates – phonetically similar words with the same meaning in two related languages, and differing by regular sound correspondences – such as English and Spanish cognates beginning with 'f' and 'p', respectively (father, fish and foot versus padre, pez and pie).

As is stated in Ashby, et al., (2005, 81), consonants change less compared to vowels:

> It seems then that, at least in some languages, vowels carry less information than consonants. It is perhaps because of this that vowels tend to be more variable and unstable than consonants. One consequence is that vowels change over time more rapidly than consonants do. If we look at the system of sounds used in two forms of the same language separated in time by a few hundred years, it is a good bet that there will have been more changes in the vowel system than in the consonant system.

Consonant changes can be observed in present-day English in some contexts, although they are variable. One of them is called G-dropping (Teschner, 2004, 184):

> … in casual styles /ŋ/ variably changes to [n] throughout the English-speaking world by a rule popularly called "G-dropping":
> ŋ → n/ V̆ _____ # (where V̆ = unstressed vowel)

There is also a shift of /t/ or /d/ to a flap (Teschner, ibid., 189):

> … between vowels when the second vowel is unstressed, and especially when the first one is stressed. When this happens, both /t/ and /d/ weaken to an alveolar FLAP in which the tip fails to hold a firm stop and instead just flips up and hits the alveolar ridge. In the IPA, this slap is shown as [ɾ]. … The rule can be stated as follows:
> alveolar stop → [ɾ] / V(r, n) ____ V̆
> … Flapping is widespread in North American and Australian English.

In addition, /j/ presents various phenomena (Teschner, ibid., 198):

> … as in other languages, /j/ has often assimilated a preceding consonant to its palatal position in a process called PALATALIZATION. In modern English, it is better called ALVEOPALATALIZATION because the /j/ causes alveolars to become alveopalatals. The rule is stated as follows, …
> tj dj sj zj → tʃ dʒ ʃ ʒ / V́ ____ (n, r) V̆
> The rule is variable, though. … there is still variation: thus most of us today say issue as [ɪʃu], whereas some retain older [ɪsju], …

As Bybee (ibid., 251, 267) states, frequency in use plays an important role in these consonant changes:

> … many, if not all, sound changes progress in lexical items as they are used, with more frequently-used words undergoing change as a faster rate than less-frequently used words. … The evidence that sound change has an immediate effect on the lexicon is that words change gradually and at different rates according to their token frequency, even while a 'rule' is still 'variable'.

By observing the consonant changes in words that are used frequently, it may be possible to find unidirectionality in these sound changes.

Vowel shifts

The Great Vowel Shift, which occurred from the 15th century to the 17th century, shifted /e:/ to /i:/, /i:/ to /ai/ and /o:/ to /u/ (Mikawa, 2006, 28). Ashby, et al. (2005, 81) present these shifts from Middle English to Early Modern English, and then to present-day English:

/i:/ → /ei/ → /ai/
/e:/ → /i:/ → /i:/
/ɛ:/ → /e:/ → /i:/
/a:/ → /ɛ:/ → /eɪ/
/ɔ:/ → /o:/ → /əʊ/

/o:/ → /u:/ → /u:/

/u:/ → /oʊ/ → /a:/

It might be easy to understand what the Great Vowel Shift is if we can find a simple rule that determine these shifts. This is not, however, as simple as it might seem as these shifts present both directions of marginalization (hyper-articulation) and centralization (hypo-articulation). Some of them appear to reveal hyper-articulation; /e:/ → /i:/ → /i:/, /ɛ:/ → /e:/ → /i:/, /o:/ → /u:/ → /u:/, and others hypo-articulation; /a:/ → /ɛ:/ → /e:/, /ɔ:/ → /o:/ → /əʊ/, /u:/ → /oʊ/ → /aʊ/, and there is one that does not show either way; /i:/ → /ei/ → /ai/.

Vowel shift is not only an old story, but it is ongoing with apparent phenomena in the present-day English of some countries, areas, social classes or sexes (Gordon, Campbell, Hay, Maclagan, Sudbury, and Trudgill, 2004, elicited from Drager, 2011, 102):

> These vowels (TRAP, DRESS, and KIT, inserted by the author) have been involved in a push chain, such that TRAP has raised into the space of DRESS, DRESS has raised into the space of KIT, and KIT has centralized.

The push chain, /æ/ → /e/ → /ɪ/ → /ə/, seems to present the direction of the hypo-articulation. One of these vowels, /æ/, shifts very well. It is categorized as a lax vowel, but in some dialects, it is assigned to be tensing. Kiparsky (1995, 651) proposes its rule and its production of continuum:

> The original environment of the æ - Tensing rule was before tautosyllabic *f, s, θ, -nt, -ns,* as in *pass, path, laugh, aunt, dance.* It became generalized to apply before the nasals *n, m* in all the Mid Attlantic dialects, and later before voiced stops as well. … In the Northern Cities, the æ-Tensing rule yields a continuum of tensing and raising, with most tensing before nasals and least tensing before voiceless stops.
>
> Tensing environments in Norhern Cities dialects:
>
> nasals voiced stops fricatives voiceless stops
>
> (tensest) <————————————————> (laxest)

Thus, the contexts have effects on the direction of vowel shifts. Yaeger-Dror (1994, 268) presents the cases of peripheralization and centralization:

> Over the years, linguists have found that even in casual speech, when plotted on a two-dimensional grid representing phonetic "space," stressed vowels before high-sonority consonants (like voiced fricatives) are longer, and reach or even overshoot their vowel target. … In contrast, the shortest vowels – those before low-sonority consonants …, and in less stressed positions – are the most reduced and centralized; …when these short vowels shift to a new position it will be toward this more neutral centralized position.

Labov (1993, elicited from Kiparsky, 1995, 662) put these types of vowel shifts into three types and explains their occurrences in a simple way:

> The most important generalizations about the direction of vowel shifts is that tense (or "peripheral") vowels tend to be raised, lax (nonperipheral) vowels tend to fall, and back vowels tend to be fronted. … tenseness-triggered raising and laxness-triggered lowering occur only in languages which have both tense and lax vowels in their inventories at some phonological level of representations.

The hypothesis that vowel shifts are the result of a tendency to maximize perceptual distinctness, however, is undermined and the alternative explanation is being explored (Kiparskey, ibid., 663):

> … tenseness can trigger vowel shift if it is present in the language's phonological representations – not necessarily underlyingly, but at any phonological level where it can feed the phonological rules that assign default values for the height features. … an abstract distinction at yet another level, that between phonetic and phonological tenseness/laxness, would also be critical to sound change.

Levels between phonetic and phonological features also can be explored by studying vowel shifts in social contexts. In some areas, and for younger generations, especially with the words by female speakers, apparent vowel shifts can be observed (Warren, et al., 2007, 87):

> Young New Zealanders are often berated by their elders, in letters to newspaper editors

> and elsewhere, for failing to distinguish the vowels in words like beer and bare. … While both vowels were still widely present in 1983, by 1998 the merger towards near was almost complete. … the two sounds are moving towards one of the existing forms, rather than using the whole range of pronunciations previously available to both.

Furthermore, it is pointed out that the vowel shift of /ɪə/ to /eə/ is associated to their frequency (Warren, et al. ibid., 106). The importance of frequency in use to sound change can be inferred from its study of grammar. Word frequency explains some of the sound changes as is described in Bybee (2000, 250).

> Over the last twenty years a significant functionalist trend has developed in the study of morphosyntax with the aim of explaining the nature of grammar by studying how language is used in context. The basic premise of this work is that frequently-used patterns become conventionalized or fossilized as grammatical patterns; that is, grammar is emergent from language use.

It is estimated that studying the present-day English of varying styles may also lead us to find a simple answer that explains the direction of vowel changes.

Stress shifts

Stress might shift less, historically, compared to consonants or vowels. There is no so called Great Stress Shift recorded in the language studies. Stress, however, in old Hebrew is observed to shift (Tabata, 1981, 90). They are also important issues for phonological, phonetic, sociolinguistic studies and those of language in use. Stress placement is explained very well in the framework of phonological rules. The rule that governs the shifting of stress, Rhythm Rule, however, needs to be considered to hold metrical features that are nonlinear, autosegmental and suprasegmental. It explains the phenomenon in which the stress shifts from the stressed syllable to the left one to avoid stress clash in a phrase, such as *thirtéen mén / thírteen mén, or Japanése líterature / Jápanese líterature* (Tanaka, 2005, 85).

Stress shift is explained with the framework of rhythm rules in metrical phonology. (Grabe, E. et al., 1995, 95):

> Metrical Phonology has given considerable attention to stress shift of the “thirteen men”

> type. This phenomenon is said to apply when a word such as *thirtéen*, with two full vowels and the strongest prominence on the last stressable syllable in citation form, is closely followed by a further strong syllable such as men. In such cases, the stresses "clash", and the prominence pattern of *thirtéen* is reversed, producing the sequence *thírteen mén*.

This comes from the tendency for keeping a particular spacing of stressed syllables (Grabe, E. et al., ibid., 95):

> One notion that has been used in the description of stress shift in English phonology is eurhythmy, i.e., a general tendency towards a particular spacing of stressed syllables so that utterances exhibit a preferred periodicity. In English, this preference is reflected in a tendency for stressed and unstressed syllables to alternate.

The Rhythm Rule is also explained very well with the framework of optimality theory, that puts an emphasis on restrictions. Selkirk (1984, elicited from Elenbaas and Kager, 2004, 184) proposes a Principle of Rhythmic Alternation, with Anti-class Provision and an Anti-lapse Provision:

> The Principle of Rhythmic Alternation
> a. Anti-clash Provision
> Every strong position on a metrical level n should be followed by at least one weak position on that level.
> b. Anti-lapse Provision
> Any weak position on a metrical level n may be preceded by at most one weak position on that level.

For the explanation of the Rhythm Rule, a hypothesis about eurhythmy is also proposed in Hayes (1984, 70):

> I have assumed that the rules of eurhythmy are based on syllable count. But there is an alternative to syllable counting that I believe deserves serious consideration. This is that the spacing requirements of eurhythmy are phonetic, either based on actual physical

time, or perhaps some more abstract phonological timing measure.

Stress shifts could be explored from the phonetic point of view as well. They would be observed not as in tokens of two words phrases but also in language contexts, such as sentences and paragraphs. As is stated in the properties of stress systems in Kager (1995, 367), they come from natural rhythm in spoken language:

> Firstly, stress is culminative, that is, in stress languages (with few exceptions) every (content) word has at least one stressed syllable. Second, stress is hierarchical, since a prominence hierarchy may occur among multiple stresses. Third, stress is delimitative in systems where it marks word edges. Fourth, stress is rhythmic in systems where stressed and stressless syllables alternate, and where clashes (adjacent stresses) are avoided. Naturally, stress does not assimilate to adjacent syllables, as this would produce clashes. Fifth, stress contrasts tend to be enhanced segmentally: stressed syllables may be strengthened by vowel lengthening or by germination, while stressless syllables may be weakened by vowel reduction.

As vowel lengthening or reduction is related to stress shifts, a whole context needs to be observed besides those in target phrases. Furthermore, styles of speech, such as quiet or hurried speech, would be better to be taken into consideration. Tabata (ibid., 89, 95) points out that the rhythm rule is optional for phrases especially when they are uttered in a slow tempo.

Conclusion

The topic of this study is to take the first step of attaining the phonological goal in which some rules are to be found from phonetic phenomena. By analyzing phonological or phonetic shifts, such as consonant shifts, vowel shifts and stress shifts, their relationships can be depicted and also the reason for the formation of those relationships explained.

Shifts in vowels, consonants or stresses observed in present-day English of several types of contexts are different from those claimed to reflect English history. They are not dispersed ones but continuous or graded ones in some special contexts. Phonemic features sometimes need to be observed from the stand point of phonetic phenomena. Fujimura (2007, 83) even proposes to call syllables as a concatenate unit and to consider the speech flow of vowels as metrical and as a basic function.

The effect of language or social contexts and frequency of use of the target items are also important factors for sound shifts. Some affect the least frequent words first, while others affect the most frequent word first. Such distinctions are not predicted by Lexical Phonology or Optimality Theory, but are consistent with a usage-based phonology into which word frequency, reflected by lexical strength, and the notion of lexical analysis have been incorporated (Phillips, 2006, 31). The facts also support the hypothesis that sound change occurs in real time, with its effects being registered in the lexicon as small incremental changes, such that words that are used more often will undergo change at a faster rate (Phillips, *ibid*., 66).

This survey implies that the use of phonetic analyses to explain phonemic rules or restrictions would promote the studies of speech sciences. Observing consonant changes and vowel changes and stress shifts in some special contexts is more of a language specific choice while finding unidirectional phenomena in vowel shifts or consonant shifts and observing temporal rhythms in stress shifts is more language-universal.

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音韻論的で音声学的な変化について

冨　田　かおる

言語音声の変化は音韻論的な立場や音声学的な立場から研究されてきた。これに加えて，両者に跨る立場が主張される場合も有る。本稿では，音韻論的かつ音声学的アプローチに加え，言語が話される状況や言語用法の要因をも考慮に入れることにより，音声変化の研究がより前進することを提言する。

子音は第一次子音推移，第二次子音推移と，歴史的に観察されている。文脈に依存するものではあるが，現代英語でも子音が変化する例がいくつか見られる。例えば，強勢の無い母音の後で [ŋ] が [n] に変わる，強勢を持つ母音と強勢の無い母音に挟まれると [t] や [d] が [ɾ] に変わるなどである。

母音は大母音推移が歴史的に観察されている。現代英語では，複数の母音，例えば [æ] [e] [ɪ] [ə] が順々に変化する例が，ある特定の状況で観察されている。また，特に [æ] の母音が文脈に依存し，変化の度合いが異なることも観察されている。鼻音の前では最も変化しやすく，無声破裂音の前では変化が起こりにくいなどの例が特定の地域で観察されている。

子音や母音が変化する理由や，変化の型，もしくは一定の傾向が音韻論，音声学，音声科学を通して研究されている。これらの変化は，特定の言語が持つ音声体系に従って音声変化が起こっているものや，発声音の聞きやすさに応じるような傾向で変化が起こっているものが観察されている。

音声変化は特定言語の音声体系や言語上の文脈の影響のみからでは説明できない場合もある。特定の話者やある状況に限られた例については，その変化の方向や程度を種々の観点から長期的に調べ説明する必要がある。そのひとつとして，言語の使用頻度を考慮に入れることが必要な場合もある。また，発話の状況や種類を考慮に入れることも考えられる。

強勢移動は子音や母音に比べ，歴史的に観察されているものは少ない。現代英語では，韻律音韻論でリズム規則に基づく説明や最適性理論で，強勢の位置が少なくとも1つの弱勢を必要とし，弱勢の位置はせいぜい1つの強勢を許容するという制約で説明されるものである。元来 thirtéen mén と発せられる句が thírteen mén と強勢の位置を変えて発せられる例についてである。

言語発声におけるリズム感覚を強勢移動の分析に応用することで，種々の現象を説明することができる。落ち着いて話した場合と急いで伝えた発話での違いなどを分析することも必要であろう。この様に，音韻論の枠組みで説明されている規則や制約を社会言語学的観点や言語用法の観点から再度観察し直し，音声学的分析によって説明を試みることによって，新たな知見が得られると思われる。